

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
14 October 2004 (14.10.2004)

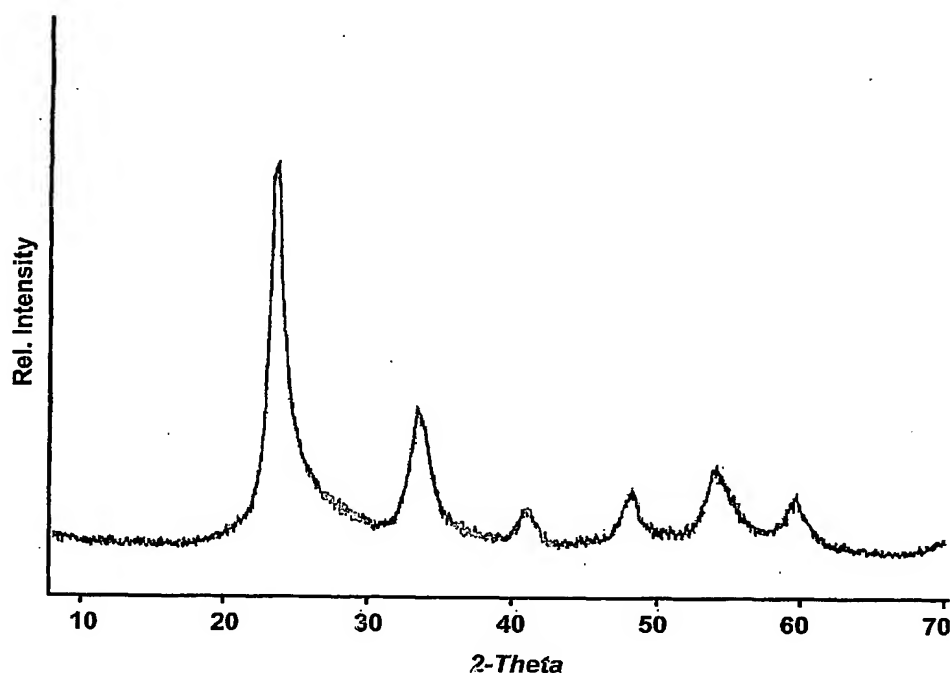
PCT

(10) International Publication Number  
**WO 2004/088780 A1**

- (51) International Patent Classification<sup>7</sup>: **H01M 8/02**, 4/90, C01G 41/02, B01J 23/30
- (21) International Application Number: PCT/US2004/009019
- (22) International Filing Date: 25 March 2004 (25.03.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/320,056 26 March 2003 (26.03.2003) US
- (71) Applicant (for all designated States except US): **OSRAM SYLVANIA INC.** [US/US]; 100 Endicot Street, Danvers, MA 01923 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **CHRISTIAN, Joel, B.** [US/US]; 37 Third Street, Towanda, Pennsylvania 18848 (US).
- (74) Agent: **CASTEL, Benoit**; c/o YOUNG & THOMPSON, 745 South 23rd Street, Suite 200, Arlington, VA 22202 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: TUNGSTEN-BASED ELECTROCATALYST AND FUEL CELL CONTAINING SAME



(57) Abstract: The catalyst of this invention is a non-stoichiometric tungsten compound,  $\text{H}_{0.53}\text{WO}_3$ , which may be used as both the anode and cathode electrocatalyst for acid-style low-temperature fuel cells. A fuel cell using the tungsten-based electrocatalyst as both the anode and cathode has been constructed and operated with a hydrogen fuel and an air oxidant.

WO 2004/088780 A1



**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*